HARRIS'S HAWK (*Parabuteo unicinctus*)

Richard A. Erickson, LSA Associates, 20 Executive Park, Suite 200, Irvine, CA 92614; richard.erickson@lsa-assoc.com

Michael A. Patten, Sutton Avian Research Center and Department of Zoology, University of Oklahoma, P.O. Box 2007, Bartlesville, OK 74005; mpatten@ou.edu

Criteria Scores

Population Trend	Range Trend	Population Size	Range Size	Endemism	Population Concentration	Threats
10	10	10	10	0	5	5

Special Concern Priority

Currently considered a Bird Species of Special Concern, Priority 2. Included on CDFG's (1992) unprioritized list and on the original prioritized list, Highest Priority (Remsen 1978).

Breeding Bird Survey Statistics for California

No data available (Sauer et al. 2001).

General Range and Abundance

Ranges from southern California, southern Arizona, southern New Mexico, and southern Texas south through Middle and South America to central Chile and central Argentina—and rarely and/or irregularly north and east as far as southern Nevada, Utah, Colorado, Nebraska, Missouri, and Mississippi (Bednarz 1995, AOU 1998, Sibley 2003). Because the species is so popular among falconers, records farther removed from its normal range (e.g., Iowa, Wisconsin, Ohio, New York, Florida) perhaps more likely escapees from captivity (Palmer 1988, Bednarz 1995, AOU 1998). "Boom-bust" reproductive strategy apparently results in unstable populations on the fringe of the range that expand and contract geographically (Bednarz 1995, Dawson 1998, Patten and Erickson 2000). Presumably this has resulted also in mixed reviews concerning increases or declines in various parts of the range over time. Generally considered uncommon to locally fairly common (DeSante and Pyle 1986, Parker et al. 1996), but said to be common in some parts of its range

(Brown and Amadon 1968, Bierregaard 1994). Estimates of nesting densities 2—5 nests/10 km^2 in Arizona, 0.29—2.4 nests/10 km^2 in New Mexico, and 2.3 nests/10 km^2 in Texas (Bednarz 1995). Estimates of winter density include 1.12—2.60 hawks/10 km^2 in New Mexico and high densities of 1.49 hawks/hectare recorded on two Christmas Bird Counts in Texas (Bednarz 1995).

Birds in southwestern United States and northwestern Mexico described as subspecies *superior* (van Rossem 1942), but many authorities merge these with subspecies *harrisi* of Texas, eastern and southern Mexico, and Central America (e.g., Bednarz 1995).

Seasonal Status in California

Occurs year round; breeding season extends from early February through July (Rosenberg et al. 1991), but occasionally year round elsewhere in the southwestern United States and northwestern Mexico (Palmer 1988, Bednarz 1995).

Historical Range and Abundance in California

Patten and Erickson (2000) summarized the history of Harris's Hawk in California, emphasizing the cyclic nature of their occurrence and suggesting that California is on the fringe of the natural range. The following account is based on their paper, except where noted, and is divided based on three geographic regions: the lower Colorado River Valley, the Imperial Valley, and the coastal slope. Harris' Hawk was first recorded at an undisclosed locality on the Arizona side of the Colorado River in 1854 (Swarth 1914), was missed altogether on the river by Elliot Coues in the 1880s and 1890s, and was first recorded on the California side of the river in 1902 near Ehrenberg and near Palo Verde, where up to 10—20 were in the air at one time. The species was unrecorded again in 1910 during Joseph Grinnell's exhaustive survey of the length of the lower Colorado River Valley. Birds were refound on the river in 1916, including the first nesting record for California near Palo Verde (Rosenberg et al. 1991). Thereafter, birds were recorded regularly to the 1960s (see below), but only from the Blythe area south. More detailed information on the Colorado River situation was provided by Rosenberg et al. (1991). Records from the Colorado River delta in Baja California

basically track this pattern: specimens collected in April 1894 and April 1905, first nesting recorded in the 1910s, and the most recent specimen collected on 22 October 1927 (Grinnell 1928).

Patten et al. (2003) summarized the history of Harris's Hawk in the Imperial Valley: first recorded (nesting) in 1920, common by the early 1920s (although reports of hundreds are doubted; Philips et al. 1964, Palmer 1988), and last recorded 9 March 1954.

There are only two historical records of apparently wild Harris' Hawk from the coastal slope of California, both from San Diego County: 17 November 1912 in Mission Valley and 1—6 November 1942 at Oceanside. Both generally are considered to have involved wild birds (e.g., Grinnell and Miller 1944, Garrett and Dunn 1981, Unitt 1984). Historical records from northwesternmost Baja California come from 40 miles south of San Diego 10 May 1885 and Ensenada prior to 1925 (Grinnell 1928).

Recent Range and Abundance in California

The California Harris's Hawk population appears to have peaked in about the middle of the 20th century. Rosenberg et al. (1991) described the decline on the Colorado River as follows. A few individuals (1-5) were seen each winter at Imperial National Wildlife Refuge during the 1940s and 1950s, and the last record there was of a failed nest in 1961. Although unrecorded as far north as Havasu National Wildlife Refuge (Topock Marsh and vicinity) until December 1946, a maximum count of 30 was obtained on a Christmas Bird Count there on 27 December 1950 and more than 20 were recorded on winter counts until at least 1953. Only two birds remained by the spring of 1961 and they disappeared soon thereafter. The last certain wild bird seen on the river was one north of Blythe on 28 November 1964. Occasional birds seen in the late 1970s may have been escapees. The decline in the Imperial Valley came sooner, as summarized by Patten et al. (2003): the last certain wild bird was seen on 9 March 1954 and occasional birds seen since generally have been considered released birds or escapees (e.g., released birds attempted to nest near Niland in 1976).

Rosenberg et al. (1991) and Patten and Erickson (2000) summarized a 1979—1989 reintroduction program for Harris's Hawks on the Colorado River in the vicinity of Imperial and Cibola National Wildlife Refuges that involved 222 released birds and resulted in up to five nesting pairs in 1989. Despite reports to the contrary (e.g., Bierregaard 1994), the population is not believed to be viable.

Beginning in April 1994, Harris's Hawk made its most recent reappearance in California. As summarized by Patten and Erickson (2000), a population expansion in northern Baja California is believed to have resulted in records of wild birds at least as far as Victorville, San Bernardino County, farther northwest than the species had ever been recorded. The incursion involved nearly 50 birds and peaked quickly. It is unclear if birds west to the coastal slope and east to the Colorado River were involved or if they were of unnatural occurrence. Most birds were found in eastern San Diego County, where up to eight in Borrego Valley exhibited nesting behavior in 1994 and 1995, and up to nine birds in McCain Valley, north of Boulevard, attempted nesting in most years since 1994 and fledged three young each year 2000—2002 (San Diego Bird Atlas unpub. data). As of spring 2003, apparently all that remained of the incursion was several birds in McCain Valley, where a captive bird may serve as an attraction (San Diego Bird Atlas unpub. data), one bird in Borrego Valley (P. Jorgensen pers. comm.), and one bird in the Blythe area that may or may not have been involved (G. McCaskie pers. comm.).

Ecological Requirements

Throughout the range, Bierregaard (1994) considered the species an opportunistic generalist with broad tolerance in terms of habitat and food.

Habitat. Bednarz (1995) characterized the habitat as "Semiopen desert scrub, savanna, grassland, and wetland habitats. Scattered larger trees or other features (e.g., power poles, woodland edges) apparently provide important perches and nest supports." Further: "The amount of exposed ground may also be an important factor affecting the availability of prey for Harris'

Hawk and may account for this species' association with arid habitats …. Access to water may also be necessary for Harris' Hawk occupancy, especially in hot environments." Parker et al. (1996) identified Harris's Hawk as an indicator species of arid lowland scrub in northwestern Mexico.

Grinnell and Miller (1944) described habitat in California as "deciduous woods and adjacent open ground, of river or delta bottomlands." For the lower Colorado River Valley, Rosenberg et al. (1991) elaborated that birds frequented "desert-scrub and mesquite habitats where saguaro cacti [*Carnegiea gigantea*] or riparian trees provide nest sites. This species used mesquite and willow groves along the Colorado River, often adjacent to marshy backwaters, as well as downed trees." In the Imperial Valley, Patten et al. (2003) reported that they "formerly occurred in woodlands and ranches with extensive Honey Mesquite [*Prosopis glandulosa*] and Fremont Cottonwood [*Populus fremontii*], a habitat extensive in the valley at the time. Recent records have been of birds in more urban settings, often using utility poles as roost sites. The June immature was foraging along thickets of Saltcedar [*Tamarix ramosissima*] and Common Reed [*Phragmites australis*], but other birds appeared to be foraging around agricultural fields." Birds in the Borrego Valley and McCain Valley since the mid 1990s have been associated with rural/residential areas, as has become increasingly common elsewhere in the southwestern United States (AOU 1998, Dawson 1998, Patten and Erickson 2000).

Food: Palmer (1988), Bierregaard (1994), and especially Bednarz (1995) provided detailed summaries of food items range wide, emphasizing the wide variety of animals consumed. Mammals such as rabbits (*Sylvilagus* sp. and *Lepus californicus*), ground squirrels (*Spermophilus* sp.), and woodrats (*Neotoma* sp.) are primary prey, followed by birds ranging in size from Cactus Wrens (*Campylorhynchus brunneicapillus*) to pheasants (*Phasianus colchicus*) and night-herons (*Nycticorax/Nyctanassa*), lizards, frogs, fish, large insects, and occasionally offal. Food items recorded in the lower Colorado River Valley include Arizona Cotton Rat (*Sigmodon arizonae*), Muskrat (*Ondatra zibethicus*), American Coot (*Fulica americana*), ducks (particularly Green-

winged Teal *Anas carolinensis*), Common Moorhen (*Gallinula chloropus*), Sora (*Porzana carolina*), and flicker (*Colaptes* sp.) (Rosenberg et al. 1991). Chickens are often taken in Latin America (Bednarz 1995) and have been taken by birds in the McCain Valley as well (San Diego Bird Atlas unpub. data).

Threats

Current threats to this species in California appear to be relatively minor.

Although White (1994) considered Harris's Hawk highly adaptable, Bierregaard (1994) emphasized its broad tolerance, and Remsen (1978) de-emphasized the importance of habitat loss in California, most authors consider the loss of suitable arid scrub the primary threat to this species (e.g., Oberholser 1975, Garrett and Dunn 1981, Palmer 1988, Rosenberg et al. 1991, Bednarz 1995, Patten and Erickson 2000). But the threat of habitat loss on this species in California has been largely realized on the Colorado River and in the Imperial Valley (Rosenberg at al. 1991, Patten and Erickson 2000, Patten et al. 2003). A slight increase in the amount of available habitat may now be underway as a result of habitat restoration efforts (Rosenberg et al. 1991) and ornamental planting associated with rural development (e.g., most California birds since the mid 1990s have been associated with rural/suburban developments).

Remsen (1978) suggested that falconry was the primary cause of the decline of this species in California but Brian J. Walton has found no evidence that falconers ever harvested Harris's Hawks in California (Patten and Erickson 2000). Because of the number of birds bred in captivity, falconry is unlikely to be a significant factor impacting wild populations in California in the future.

Shooting was identified as a cause of mortality by Palmer (1988) and Bednarz (1995), and may be the most significant threat to the small California population today, especially as the birds occupy rural areas in association with humans. Four birds are known to have been shot in the Boulevard area since 1994 (San Diego Bird Atlas unpubl. data).

Other documented causes of mortality include electrocution, drowning, and capture in coyote traps (Palmer 1988, Bednarz 1995). There is no evidence of biocides resulting in eggshell thinning or otherwise affecting populations in the Unites States (Palmer 1988, Bednarz 1995), but declines in parts of Argentina are believed to have resulted from the use of strychnine by sheep ranchers (Bierregaard 1994). Bednarz (1995) noted sensitivity during nesting and reported that hunting and off-road vehicles have caused nest disturbances.

Management and Research Recommendations

- initiate extensive mesquite and native riparian restoration programs in the lower Colorado River Valley and Imperial Valley, incorporating Saguaro on the Colorado River.
- protect known/potential nesting groups through education and restrictions when necessary, including providing compensation to individuals that lose poultry to predation.
- while the population remains small, monitor all nesting attempts in an effort to better understand what factors are influencing population levels.
- consider supporting known nesting groups through release of captive birds, as needed.
- consider using captive birds to introduce new nesting groups into suitable habitat, although previous efforts were apparently unsuccessful.

Monitoring Needs

Through coordination with the birding community, all occupied sites should be censused annually (in winter?) and all nesting attempts monitored. Complete surveys of suitable habitat in the lower Colorado River Valley, Imperial Valley, Borrego Valley, and McCain Valley should be conducted every five years (in winter?).

Acknowledgments

Philip Unitt provided unpublished data from the San Diego Atlas project and Guy McCaskie and Paul Jorgensen provided updates on Harris's Hawk in southern California in 2003.

Literature Cited

American Ornithologists' Union. 1998. Check-list of North American Birds. 7th ed. Am. Ornithol. Union, Washington, D.C.

Bednarz, J. C. 1995. Harris' Hawk (*Parabuteo unicinctus*), in the Birds of North America, No. 146 (A. Poole and F. Gill , eds.). Acad. Nat. Sci., Philadelphia.

Bierregaard, R. O. 1994. Harris' Hawk (*Parabuteo unicinctus*), in the Handbook of Birds of the World, vol. 2 (J. del Hoyo, A. Elliott, and J. Sargatal, eds.). Lynx Edicions, Barcelona.

Brown, L., and Amadon, D. 1968. Eagles, Hawks and Falcons of the World, vol. 2. McGraw-Hill, New York.

California Department of Fish and Game. 1992. Bird species of special concern. Unpubl. List, July 1992, Calif. Dept. Fish & Game, 1416 Ninth St., Sacramento, CA 95814.

Dawson, J. W. 1998. Harris' Hawk, in The Raptors of Arizona (R. L. Glinski, ed.). Univ. Arizona Press, Tucson.

DeSante, D. and Pyle, P. 1986. Distributional Checklist of North American Birds. Artemisia Press, Lee Vining, California.

Garrett, K., and Dunn, J. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Soc., Los Angeles.

Grinnell, J. 1928. A distributional summation of the ornithology of Lower California. Univ. Calif. Publ. Zool. 32:1—300.

Grinnell, J., and Miller, A.H. 1944. The distribution of the birds of California. Pac. Coast Avifauna 27.

Oberholser, H. C. 1975. The Bird Life of Texas, vol. 1. Univ. Texas Press, Austin.

Palmer, R. S. (ed.) 1988. Handbook of North American Birds, vol. 4. Yale Univ. Press, New Haven, Connecticut.

Parker, T. A., III, Stotz, D. F., and Fitzpatrick, J.W. 1996. Ecological databases, part 4 in Neotropical Birds: Ecology and Conservation (D.F. Stotz, J.W. Fitzpatrick, T.A. Parker III, and D.K. Moskovits). Univ. Chicago Press, Chicago.

Patten, M. A., and Erickson, R. A. 2000. Population fluctuations of the Harris' Hawk (*Parabuteo unicinctus*) and its reappearance in California. J. Raptor Res. 34:187—195.

Patten, M. A., McCaskie, G., and Unitt, P. 2003. Birds of the Salton Sea: Status, Biogeography, and Ecology. Univ. Calif. Press, Berkeley.

Phillips, A., Marshall, J., and Monson, G. 1964. The Birds of Arizona. Univ. Ariz. Press, Tucson.

Remsen, J. V. 1978. Bird species of special concern in California: An annotated list of declining or vulnerable bird species. Nongame Wildl. Invest., Wildl. Mgmt. Branch Admin. Rept. 78-1. Calif. Dept. Fish & Game, 1416 Ninth St., Sacramento, CA 95814.

Rosenberg, K. V., Ohmart, R. D., Hunter, W. C., and Anderson, B. W. 1991. Birds of the Lower Colorado River Valley. Univ. Ariz. Press, Tucson.

Sauer, J. R., Hines, J. E., and Fallon, J. 2001. The North American Breeding Bird Survey, results and analysis 1966-2000. Version 2001.2, USGS Patuxent Wildl. Res. Ctr., Laurel MD (http://www.mbr-pwrc.usgs.gov/bbs/bbs.html).

Sibley, D. A. 2003. The Sibley Field Guide to Birds of Western North America. Alfred A. Knopf, New York.

Swarth, H. S. 1914. A distributional list of the birds of Arizona. Pac. Coast Avifauna 10.

Unitt, P. 1984. The birds of San Diego County. San Diego Soc. Nat. Hist. Mem. 13.

van Rossem, A. J. 1942. Notes on some Mexican and Californian birds, with descriptions of six undescribed races. Trans. San Diego Soc. Nat. Hist. 9:377—384.

White, C. M. 1994. Population trends and current status of selected western raptors. Studies in Avian Biology 15:161—172.